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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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26371	7590	03/01/2005	EXAMINER	
FOLEY & LARDNER 777 EAST WISCONSIN AVENUE SUITE 3800 MILWAUKEE, WI 53202-5308			DEB, ANJAN K	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,535

Applicant(s)

KOCH, INGO

Examiner

Anjan K. Deb

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/06/04, 09/17/04, 12/19/2003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 13 is objected to because of the following informalities: Claim 13 depends from claim 13. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1,25 are rejected under 35 U.S.C. 102(e) as being anticipated by Ochiai et al. (US 6,522,148 B2).

Re claims 1,25 Ochiai et al. discloses method and monitoring device for determining the amount of charge (state of charge) which can be drawn from a storage battery by measuring at least one of battery currents and battery voltages at least at two points in time before or during a rise phase and during or after a decay phase of a charging or discharging operation (column 6 lines 55-63), the method comprising determining a characteristic variable for the amount of charge (state of charge), the characteristic variable being derived from battery current value from the rise phase and the decay phase (accumulating charge and discharge currents)(column 7 lines 40-45).

4. Claims 1-9, 14, 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Eguchi (US 6,313,606 B1).

Re claims 1, 25 Eguchi discloses method and monitoring device for determining the amount of charge (battery capacity) which can be drawn from a storage battery by measuring at least one of battery currents and battery voltages at least at two points in time before or during a rise phase (point A of Fig. 2) and during or after a decay phase of a charging or discharging operation (point CE1 of Fig. 2) the method comprising determining a characteristic variable for the amount of charge (battery capacity) the characteristic variable being derived from battery current value from the rise phase and the decay phase (charging/discharge current)(column 4 lines 17-50).

Re claims 2-9 Eguchi discloses two modes of battery charge determination process (Fig. 5,6) wherein battery characteristic (battery charge) is calculated from measured battery voltages for a fixed value of battery current (set current magnitude) or determining battery characteristic (battery charge) from measured battery current values for a fixed value of battery voltage (set voltage magnitude)(column 7 lines 33-44).

Re claim 14, Eguchi discloses voltage-current characteristic is considered to estimate battery capacity (column 9 lines 23-26), broadly interpreted as interpolating or extrapolating battery current and battery voltage from battery voltage-current characteristic (curve or table).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al. (US 6,522,148 B2) in view of Meyer (US 6,472,875).

Re claim 10, Ochiai et al. did not expressly disclose the two points in time where battery voltage or current measurements are made ^{to} lie in the starting phase of internal combustion engine coupled to the battery.

Meyer discloses monitoring battery characteristic by measuring battery voltage in two points in time during the starting phase of internal combustion engine coupled to the battery (column 3 lines 50-65, column 4 lines 9-12).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Ochiai et al. by adding measuring battery voltage in two points in time during the starting phase of internal combustion engine coupled to the battery as disclosed by Meyer for determining battery condition.

Re claim 11, Ochiai et al. as modified by Meyer did not expressly disclose that battery has a current that is approximately zero at one point in time but would have been obvious since battery current is approximately zero at the point in time when battery has been fully charged and before a discharging operation, therefore this feature is inherently disclosed.

7. Claims 12,13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al. (US 6,522,148 B2) in view of Sakai (US 6,608,482 B2).

Re claims 12,13 Ochiai discloses all of the claimed limitations as set forth above except recording and storing battery current and voltage values as hysteresis curves during loading.

Sakai disclosed battery hysteresis curves for determining battery state of charge (Fig. 1a,1b).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Ochiai et al. by adding recording and storing battery current and voltage values for forming hysteresis curves as disclosed by Sakai for determining battery state of charge.

8. Claim 14-17, 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al. (US 6,522,148 B2) in view of Suzuki (US 6,507,194 B2).

Re claims 14-17, 19-23 concern correcting battery capacity as function of battery temperature. Ochiai et al. did not expressly disclose measuring battery temperature and correcting the characteristic variable (battery charge) over a period of time.

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Suzuki discloses measuring battery temperature over a period of time and correcting the characteristic variable (battery charge) by calculating battery capacity based on battery temperature.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Ochiai et al. by adding measuring battery temperature over a period of time as disclosed by Suzuki and correcting the characteristic variable (battery charge) by calculating battery capacity based on battery temperature.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi (US 6,313,606 B1).

Re claim 18, Eguchi discloses all of the claimed limitations as set forth above except expressly disclosing that the time period between the two points in time is above a defined minimum and below a defined maximum time but would have been obvious as required for obtaining the integrated value of battery capacity (Fig. 4).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Eguchi by adding time period between the two points in time is above a defined minimum and below a defined maximum time as required for obtaining the integrated value of battery capacity (Fig. 4).

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ochiai et al. (US 6,522,148 B2) in view of Dougherty (US 20030236656 A1).

Ochiai et al. disclosed all of the claimed parameters as disclosed above except determining characteristic variable from parameters of an equivalent circuit model.

Dougherty discloses determining characteristic variable (battery state of charge) from parameters of an equivalent circuit model, wherein the parameters are determined from measuring battery current and voltage in the rise and decay phase (charging and discharging time).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Ochiai et al. by adding determining characteristic variable (battery state of charge) from parameters of an equivalent circuit model as disclosed by Dougherty so as to model the performance of a battery in a vehicle.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Laig-Hörsterbrock et al. (US 6,392,415 B2) discloses method of determining characteristic variable (battery state of charge) by measuring paired values of battery voltage and current (U_i , I_i) over a period of time.

Bader (US 3,906,329) discloses method of measuring battery charge condition by a model as a function of battery temperature.

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Bertness (US 6,331,762 B1) discloses battery charge monitor for automobile battery comprising determining a characteristic variable (dynamic parameter 144) derived from measured battery voltage and battery current over a period of time (Fig. 4).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.



Anjan K. Deb

Patent Examiner

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2/17/05

Tel: 571-272-2228

Fax: 571-273-2228

E-mail : anjan.deb@uspto.gov